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Titusville Amateur Radio Club

TARC NEWSLETTER

May 1990

The President's Corner

Thanks a million to the stalwart eight who communicated boat-to-boat and boat-to-shore to coordinate the Great Indian River Raft Race on the 28th of April. Namely : Dave-W4WWG, Bud-K4CWG, Ozzie-N4SCY, Clyde-K4EOS, Lloyd-KA4LTK, Les-K4STC, Doug-N4QVY and me.

Read your newspapers carefully to find news and announcements about your club as reported by our new publicity man, Ozzie-N4SCY. He'd appreciate help in this effort to keep the public informed about "ham" radio happenings in North Brevard.

Ozzie is also the club coordinator for Field Day on the 23rd and 24th of June. This is our annual event that shows how we get our act together as a club and not only demonstrate our emergency field communications prowess but also have a lot of fun doing it. So listen up when Ozzie twists your arm for your share in this event. It's a team effort! You can even get your family and friends to get together with us at Draa Field for Field Day 1990. We get started sometime Saturday, the 24th, with antenna erections and station setups. Then we

See Corner on back

The Editor's Desk

Not much room left this month. Hello to all, especially those of you not members of TARC. Our meeting times are posted in this newsletter. Field Day is almost here... ALL are invited to participate. Thanks to Ozzie for his articles and to Val for letting me rerun last July's excellent comment on last year's Field Day. Bulletins about communicating to STS-35 via

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Upcoming Events

› May 22, June 26 - Next TARC meetings, 7 p.m., JayCees Building on Singleon Ave.

› June 23, 24 - Field Day, Draa Field, 10 a.m. setup, 2 p.m. operating

› Every Thursday night - TARC Friendship Net, 7 p.m., 146.91 MHz (-600).

› 3rd Saturday of each month - SBARC / ARRL exams, 9:30 a.m. registration, FIT room Q22 in The Quad (under ham radio mast). For info, call Jim Larson, home phone 768-1954 evenings.

› June 15 - Deadline for articles to be included in the June edition of the *TARC Newsletter.*

OFFICERS

President: Bob Nedimyer W4VQB 269-1878
Vice President: Dick Duell W9LSD 383-9733
Secretary: Doug Reed N4QVY 268-1934
Treasurer: Clyde Lee K4EOS 267-9375

Minutes of the April 28 Meeting

The meeting was called to order at 7:08 p.m. by Bob W4VQB with the Pledge of Allegiance and a moment of silence. The minutes were read by Doug, N4QVY, and were approved by those present.

Bob noted the following items: Student costs of the novice classes would probably not be as high as originally thought. New members from last month were requested to fill out the membership questionaire. Bob Young, N4DQT, has received the employer ID number from the federal government for the club. The Thursday night net seems to be getting fewer checkins. One of the future newsletters will contain a format for volunteer net controls to use. Pike, and Archie should have the antenna and coax up for the Titusville Police Department - TARC emergency communications setup. The *Star Advocate* and *News Observer* had received and printed info regarding TARC happenings and club meeting dates.

Oz, N4SCY, volunteered to be the TARC Public Relations representative. Oz reported that the "Optimists" sign will be removed soon for a "Welcome to Titusville" sign, and that work on the TARC / ARRL sign has been discontinued. Bob noted that the next activity will be the Indian River Raft Race and a minimum of 8 volunteers would be needed with HT's to man boats and the judges' stand. Bob volunteered to be the central contact.

Bob Young noted that 2 volunteers would be needed to help

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269-2327

Mission Elapsed Time & STS-35
by Ozzie - N4SCY

Launch delays are a way of life at NASA, and STS-35 may be no exception. Mission planners, however, have already released the operating schedule of WA4SIR on board the Space Shuttle Columbia.

The schedule is based on Mission Elapsed time, or MET.

MET is based on the time of lift-off at "zero" in the launch countdown, when the solid rocket boosters are lit, and the spacecraft leaves the pad at Launch Complex 39. Simply start the stopwatch feature of your electronic watch at zero in the count, and you will have MET on your watch! The kind of watch best suited will go untill 23 hours, 59 minutes, 59 seconds, and then click back to zero. Simply check the cheap watches in the blister packs at your local drug store for a watch with a "24 hour chronometer" feature.

If you should miss the launch, simply find out what time the launch happened from the newspaper, and start it 24 hours later. Set an alarm on the watch to go off a minute before the time that is 24 hours from launch. Of course, remember that you'll have to keep track of the number of elapsed days of the mission yourself.

And don't worry about looking foolish at launch time, because you have your finger on your watch. Everyone will be watching the Shuttle on TV, and not you. And if they should ask what it was you WERE doing at launch time, just look at your watch, and give them Mission Elapsed Time!

HR AMSAT NEWS SERVICE BULLETIN 125.02 FROM AMSAT HQ SILVER SPRING, MD MAY 5, 1990 TO ALL RADIO AMATEURS BT

Weberware 1.0 Imaging Software Now Available To Process WO-18 Pictures

Beta testing of Weberware 1.0 (WW 1.0) is complete their testing and it is now released for general distribution. This unique package made its debut at the Dayton Hamvention last week. Many a radio satellite enthusiast was thrilled as an actual picture captured from WEBERSAT-OSCAR-18 (WO-18) was processed on an IBM PC as they watched. Chris Williams (WA3PSD) of Weber State University (WSU) said that although the early pictures from WO-18 were perhaps not all that interesting, now that the ground controllers at WSU have a better understand of this MICROSAT's attitude motion, they have modified the on-board software so that more pictures of the earth are now being snapped. In addition, the software now maintains better control the CCD camera iris settings and settling time. Through more operational experience, many more exciting pictures of the earth are expected soon.Weberware 1.0 is designed to work on IBM PC clones which support EGA or VGA graphics. WO-18 is constantly sending picture data and the imaging data can be easily collected with a PSK modem. For further information about Weberware 1.0, contact the AMSAT-NA software exchange at (301) 589-6062.

CONNECTing to STS-35
By Ozzie N4SCY

The recent articles published by Amsat in the Amsat Journal, and 73 magazine explain that packet radio operation on the flight of STS-35 does not use the "usual" packet radio proceedures. Because amateur radio is considered a "recreational activity" by NASA (and not the "Way Of Life" we know it to be [HI]), Ron Parise WA4SIR can only operate the SAREX (Shuttle Amateur Radio EXperiment) package on his 12 hours "off shift". During most of that time, he will be asleep, but the "Robot QSO" machine will let packeteers connect with this "rare one". Things to remember when setting up, is to set your frequency to 145.550, with the duplex set to -600 KHz (watch PBBS Bulletins for any changes). Second, is that the station to try to connect to is WA4SIR-1. The thing the Amsat article forgot to tell you is, to set "MCON ON", or "MCON 4" if you have a PK-232. The "Monitor while CONnected" parameter will let you view packets that are going by while you are connected to something else, or more importantly, WHILE YOU ARE ATTEMPTING to connect to something else. The WA4SIR-1 Robot can only accept 9 connections at once. Since there are many more people than that attempting to connect over some parts of the world, you may want to watch the beacons that the space-mobile station will be sending, while attempting to link up yourself. It is possible, for example, that you will be able to see your call sign in the MHEARD list, showing that _WA4SIR-1 heard your connect request, but already had the maximum of 9 connections at the time. Copy EVERYTHING to disk, because just getting the MHEARD list is good for an SWL QSL card. You can mount it with the printout of you in the MHEARD list. QSO's with the robot will be very short. You will get a "XXX CONNECTED" message, a CTEXT type message with a QSO number in it, and a "XXX DISCONNECT" message after it gets your ACKnowledgement back. If it does not get the ACK, it will not think it has a valid QSO. If you've been "Monitoring the Mail", then you'll know you've gotten YOUR QSO number, because it will be the one on your screen WITHOUT a header line. Good luck catching the bird, and best of luck also to WA4SIR and his crewmates for a successful flight.

Minutes...
out with incoming antique cars. Les, K4SJC, and Doug volunteered.

A sheet of paper was sent around for volunteers for the TPD effort. Clyde, K4EOS, gave the treasury report: Petty cash: $26.09, bank account: $728.49.

Les gave the repeater report: Herb Daniels will allow a 2 meter receiving / 440 MHz low power transmitter setup on one of his towers adjacent to I-95. Les recommended a Hustler G144 omni. Heliax will be acquired from John Link. Les displayed one of the GE radio systems and noted that the power amp output 62 watts with 0.5 watt input. Les mentioned that he would try to borrow a spectrum analyzer to track down the desense problem. He noted that the

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The Best of Times, the Worst of Times

By Val, WB4ZUZ copyright 1989

All the members of the Titusville Amateur Radio Club were prepared for Field Day. Wayne and Ozzie had done a lot of work to get ready, and the Hams were prepared to man the transmitters for a successful event.

Coming in Saturday afternoon to sit behind a transceiver is the best of times. They are the times we all live for. The worst of times is all the thankless jobs that make Field Day possible.

The worst of times starts about 8:00 Field Day morning. Wayne announced he had enough help, so Wynn and I were not really needed for antenna erection. We showed up around 10:00 with the transceiver we promised to bring. There was a good crowd there, anxious to work. We expected to help put finishing touches on antennas, but found that only the 40 Meter antenna had been installed. Of course the antennas we used this year were much nicer than antennas we had used in the past. Most of them went up effortlessly. That is, if you don't count the blazing sun and the blinding reflection off the new aluminum bleachers.

Two hours later the 80 meter antenna was installed, and progress was being made on all the antennas. Just when everyone was thinking that we were almost done, it started to rain. We began covering the pressbox with a tarp we brought along. That sounds like such a simple task, doesn't it? After several false starts, a trip to Walmart, and acrobatics rivaled only by the Flying Wallendas, the whole pressbox was covered with tarps. The tarps were covered with exhausted Hams, and the Hams were covered with a constant drizzle of rain. The 15/20 meter tent also got a tarp, in a death defying stunt by Bud, me, and a really dull pocket knife, which I subsequently stole.

We spent a long time wrestling with tarps, and at T-15 minutes and counting, Wayne reviewed the status: not all the antennas had been installed, none had been checked out, and the auxilliary power had not yet arrived. But Archie and Harry arrived just in time so we could have power by 2:00, and all the antennas checked out fine.

At 2:04 the first entry went down on a log sheet. The best of times were about to begin. The setup Wayne arranged was convenient: 15 and 20 meters in the tent meant less congestion in the pressbox. The press box, from west to east, had 40, 80, and 10 meters, with Ozzie near the door with his points-rich jumbles of digital stuff. And because we were 5A this year, we did not have to keep constant tabs on the number of transmitters on the air at a time.

There were lots of people milling around, it was good to see a lot of familiar and unfamiliar faces turn out. Some came to contest, others to eat chips, drink Coke and just watch the fun. Everyone had a good time while racking up bundles of points. The rain even stopped.

Wynn and I ran home to catch a nap, in anticipation of the graveyard shift. We returned after 6:00 in the evening. We had a bite of dinner. I was prepared for cold hot dogs, so hot, crispy chicken was a real treat. I wish I had noticed the iced tea....

There was a lot of activity on 20, 40, and 80 meters. 10 and 15 hung in there until around 9:30, so we even got our money's worth out of them. I monopolized 40 meters working CW at 10 wpm (because it's MY transceiver, that's why). 40 meters was packed. Once, I heard a CQ but didn't notice it was not a Field Day station. So I talked to Farmer Ted for ten minutes. It was a pleasant diversion, it also gave me a clear spot on the band to use when the QSO was over. It pays to be a nice guy.

There was a surprising number of operators, even at 11:00, so Wynn and I went out for a pizza for the dedicated group. Little Caesar's won't win any awards, but both large pepperoni pizzas got eaten. At that time of night, even the diehard health food nuts will dive into a pizza.

Wynn had brought his laptop computer and began typing in entries from completed log sheets. At 2:00 there were still operators waiting to get on the air, but all the transceivers were tied up. I went home for a nap. Wynn stuck around thinking that soon all the operators would bail out. Then he would be left there alone to guard the equipment and work as many stations as he could, as he and Ozzie had done last year.

But the time never came! This dedicated group of night owls kept the transceivers busy all night. Wynn never did get a chance to get on the air. Just as well, though, he would rather compute than transmit anyway. And the points racked up on 80, 40, and 20 through the night really made a difference this year.

The vampires edged toward home as light appeared in the sky. Lots of clean, crisp operators arrived as relief. What a relief. The best of times were beginning again. There was a lot of activity on all the bands Sunday morning, and very few stations were declaring us duplicates. There were pancakes for breakfast and everyone enjoyed a short stack.

Very dedicated operators kept working until the the worst of the worst of times begin: striking the set. As each antenna came down, another operator was off the air. Taking the antennas down was not a big job, but it is anticlimactic and everyone was tired. Even after the antennas were down, the transmitters must be carried out to cars, the tent had to come down, and the tarps had to be removed. Papers, pens, clip boards, and steaming half-drunk cups of coffee searched for their owners.

Hot and tired, the press box was locked and we all got out of there at 12:30. But it was fun, and worth all the work. I guess Field Day is a lot like pizza. When it's good, it's very, very good. And when it's bad, it's still pretty good.

STS-35 SAREX Bulletins

HR AMSAT NEWS SERVICE BULLETIN 125.04
FROM AMSAT HQ SILVER SPRING, MD MAY 5, 1990
TO ALL RADIO AMATEURS BT

Shuttle Amateur Radio Experiment (SAREX) Set To Fly On May 16, 1990

STS-35 is now scheduled to lift-off on May 16, 1990. It will be carrying not only the ASTRO-1 experiment but also SAREX-II. The following is a discussion of the goals of SAREX-II by NASA and the ARRL.

SAREX-II is a secondary payload on STS-35, currently scheduled for launch on May 16, 1990. It will be located in the Aft Flight Deck of the Space Shuttle Columbia. Ron Parise, WA4SIR, the Payload Specialist and astronomer on Colum- bia will be the Astrona

SAREX-II-02 is a secondary payload on STS-37, currently scheduled for launch on November 1, 1990. It will be located in the Aft Flight Deck of the Space Shuttle Atlantis. Ken Cameron, KB5AWP, the pilot of Atlantis will be the Astronaut ham operator.

The American Radio Relay League (ARRL) is the customer on the SAREX-II payloads. NASA gave its authorization for SAREX operations for the following reasons:

To encourage our youth to become excited about science and technology, and

To familiarize large numbers of the general public with manned space flight

NASA's intent in making astronauts available for SAREX operations is to involve the largest possible number of people, particularly youngsters, in Amateur Radio and the US space program. With amateur radio clubs and hams, our astronauts will speak over am

You can easily become a part of this activity in your local school, as the astronauts will operate the SAREX equipment in the amateur two meter band. You will be able to send and receive messages via packet for periods of about 12 hours daily. The astrona

The Johnson Space Center's Amateur Radio Club station, W5RRR, in Houston, Texas, will re-transmit astronaut's signals to WA3NAN, at Goddard Space Flight Center, in Greenbelt, MD (near Washington, DC), and to W6VIO, at the Jet Propulsion Laboratory in Pasa

ARRL and AMSAT are co-sponsoring these exciting missions, with AMSAT heading up technical operations. Hundreds of Amateur Radio operators have already been working behind the scenes for months. The ARRL takes the lead with information and educational supp

1990 and amateur radio to kids of all ages in a big way. Plan on being a part of it; contact ARRL EAB now and give your best to our exciting hobby and to our hope for tomorrow: America's youth.

Listen to the ARRL Bulletins on W1AW (see QST for CW and voice bulletins) on a daily basis; and to the AMSAT Nets on Tuesdays (U. S.), 3.840 MHz, 01:30Z to 03:00Z, and on Sundays (international), 14.282 MHz, 18:00Z to 21:00Z, +/- QRM.

[ANS would like to thank ARRL and NASA for this contribution. Stay tuned next week to the ANS bulletins for more details about the STS-35 mission and its amateur radio operations.]

SAREX INFORMATION BULLETIN SAREX.001
de W3IWI 5/6/90

The WA4SIR flight aboard the STS-35 flight of the Shuttle Columbia is still officially scheduled for early May 16th (GMT), although there are some hints that it might slip by one day. The SAREX mission will carry the packet ROBOT automatic QSO machine which will allow many amateurs around the world to have two-way packet QSO's with the Shuttle during the times when our ham astronaut, Ron Parise is busy.

To work the ROBOT, you transmit on 144.950 MHz and listen to the Shuttle on 145.550 MHz. Subsequent SAREX information bulletins will give you operating hints and describe the schedule in more detail. If you are successful in making a two-way QSO, you call and your unique QSO serial number will be automatically logged and you will receive a QSL card after the mission. You will know you met all requirements of a two-way QSO by seeing your call in the QSL beacon which will be sent every 2 minutes and looks something like:

WA4SIR› QSL ‹ UI› : NI3F/186 WB2TNL/185 W3IUI/179 WB3AFL/177 NF3N/176 WA3EPT/175 N4QQ/174 W3IWI/172 JY1/153 U6MIR/127

If you are heard by the ROBOT, your call will appear in the QRZ beacon which will look something like:

WA4SIR› QRZ ‹ UI› : #3405-NE3H NI3F K1LNJ WB2TNL WB3ILO N3ACL N3FWX WA3TSD WA3USG
etcetera

where the #3405 is a serial number incremented every 2 minutes when the QRZ beacon is sent.

Unlike the QSL "worked" list, the QRZ "heard" list is not retained in the ROBOT and the laptop computer on the shuttle. In order to send SWL cards to those who were heard, it will be necessary to have amateurs around the world help to collect the list. When you are monitoring the WA4SIR SAREX transmissions, try to capture the beacons and send them in to us in machine readable format. We are only interested in the QRZ and QSL beacon information; please strip out everything else (like QSOs monitored, any

packet network addressed like this:

SP SAREX @ W3IWI.MD.USA

or via the Internet addressed like:

sarex@tomcat.gsfc.nasa.gov

and make the Subject: field contain the date/time of the beacons like: May 19 @ 03:42z

Here are several hints that may help you make a successful packet QSO with the SAREX ROBOT that will fly with Ron Parise, WA4SIR in mid-May.

1. Frequencies: Your **transmitter uplink frequency** should be 144.950 MHz and you should listen for the shuttle downlink 600 kHz higher on 145.550 MHz. ***Under no conditions should you transmit on the 145.550 downlink!***

Since there may be other packet or voice activity in your area on these frequencies, local coordination to insure a clear frequency during the ten day STS-35 mission may be needed.

2. Modulation: The uplinks and downlinks are ordinary AFSK/FM 1200 BPS signals, just like most terrestrial VHF packets. No special modems are needed. You are advised to check your transmitter's FM deviation and set it to 3 kHz or less. Most radios are typically set to 5-6 kHz and this will be too wide because of doppler shifts. If you don't have a deviation meter, listen on another radio and crank the tone level down until you hear the volume drop noticeably. Most people run too much deviation on their packet signals anyway, and you will probably find this improves the reliability on terrestrial paths too!

3. When to hear/work the shuttle: During the mission Keplerian elements and predictions will be sent frequently by WA3NAN, W5RRR, W6VIO, and many local FM repeaters, as well as by packet bulletins addressed to @AMSAT. Check with your local AMSAT area coordinators for information in your area. In general in the USA, the windows are in the late evening and early morning hours. Don't expect the SAREX hardware to be activated until the second day of the ten-day mission. Because the inclination of the shuttle orbit is only 28.5 degrees, the signals can only be heard between about +43 and -43 degrees latitude.

4. LISTEN!!!: Most packeteers don't listen to the BRAAAAP! from their radios, but you should listen during the shuttle activity. If Ron is personally available, he may turn off the SAREX packet hardware and be QRV on voice.

5. Connecting to the shuttle: All you do is to issue a connect. If you are heard, you will see something like this:

cmd: CONNECT WA4SIR
*** Connected to WA4SIR #191— Tnx QSO with the SAREX Shuttle "ROBOT" automatic QSO machine *** DISCONNECTED

When the ROBOT hears your "ack" of its transmission, it will disconnect and you will be in the log. Because the ROBOT queues information for 3 seconds and sends several replies in one transmission, you should set your DWAIT to about 4 seconds.

6. Multiple QSO's: Once you have worked the ROBOT and make it into the log, no further QSO's from you will be logged (even if you use a different SSID). Give others a chance and don't connect multiple times!

7. **Monitor!!!**: Every 2 minutes a beacon addressed to QRZ will list stations heard recently, and the QSL beacon will list those worked. Every 3 minutes the Metabeacon (up to 1.7 kbytes in 7 packet frames) addressed to QST will send text describing shuttle activities. Monitor these beacons to keep informed. In Bulletin #1 we ask for you to submit copies of the QRZ and QSL beacons you copy.

8: Your chances for success: Signals from many hundreds of stations can be heard from the shuttle. With FM transmissions, only the strongest signal "wins", just like in a DX pileup. To help, the ROBOT can have up to 9 QSO's in progress at any one time. Perserverance and a well equipped station will help -- but if activity levels are high and the uplink channels are busy, it will be a matter of luck.

Minutes...

remote receiver setup should alleviate this problem. Wynn, WB4ZUY, expressed concern about the existing 440 repeater effecting the 440 link receiver. Les said it should not be a problem.

Bob noted that Field Day will be held on June 23 and 24 and that Wayne, KB4YLY, would be participating with the MARS group this year and we would need a volunteer to direct our activities. Ozzie volunteered and said that the paperwork had been filed to secure Draa Field. Doug mentioned that the club should coordinate with the South Brevard clubs for news releases, as last year's articles in Florida Today mentioned all of Brevard's clubs except ours. Doug also said that the club needs to pick up the antennas from Dennis, N4SDI, and find an alternate site for storage.

Ozzie mentioned that there would be a computer show on May 18, 19, and 20 and we were allocated one exhibitor table in exchange for free advertising of the event in the newsletter. Doug requested club approval for advertising in the newsletter. A motion was made, seconded and carried to allow advertising of the computer show for exchange of an exhibitor table. Ozzie said that volunteers would be needed to help man the packet setup he had planned.

Bob noted that the May edition of the newsletter would be mailed to all area hams. Les said that Andy Clark of Florida Skip would like to be included on our newsletter mailing list.

Bob mentioned that we would probably hold a picnic / swapfest in the Fall, possibly at Fox Lake Park.

Bob commended Ozzie on he efforts concerning the ham display setup during the car club's exhibition at Miracle City

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The TARC Newsletter is published on a monthly basis. Articles are published based on their newsworthiness to TARC membership, space available, and ease of entry to the publishing medium.

Preferred transfer methods are EMail to Doug Reed at Tech-Talk BBS, EMail on 2 meter packet to N4QVY@KB4LB or N4QVY@WD4HIM, direct packet, 3.5" AmigaDOS 880K disk, 3.5" MS-DOS 360K disk, 5.25" MS-DOS 360K disk, direct landline modem, and print / hand-written / hardcopy formats, in that order. Separate each paragraph with a blank line for ease of re-formatting into a publishing format.

Article / classified deadline is two Fridays prior to the date of the monthly meeting. Articles may be given to the editor, Doug - N4QVY, at the IHOP on net nights, or left with Bob - W4VQB, where it will probably make its way to the aforementioned editor.

The TARC Newsletter is assembled on a Commodore Amiga computer using Gold Disk's Professional Page desktop publishing software and output to an HP compatible laser printer. Bulk printing service is donated by Brevard Office Equipment, Inc. Folding, stamping, and mailing services are typically affected by those present at the IHOP on Big Thursday. Thanks to all those involved in this maddening once (thank goodness) a month event.

Corner...

exercise our vocal chords, pound brass, and even work packet keyboard for a 24 hour period. That's right - ALL NIGHT LONG - meaning we need some strong, energetic types to operate the swing and graveyard shifts. There'll be lots of coffee and cola to keep you awake and of course the stimulus of contacting those other sleepy heads all over the 50 states. Try it - you'll like it! If you don't want to operate you can still contribute food and companionship to the nuts behind the mikes and keys (maybe even a umbrella or a flashlight). We've had some great field days in the past years and we fully expect this one to be a rousing success.

See you at the meeting - Bob

Minutes...

Mall. Ozzie gave some tips on connecting to STS-35 via packet.

The meeting was adjourned at 8:11 p.m.

Respectfully, Doug Reed, Secy.

Club Information

TARC is a not for profit organization, incorporated by the State of Florida. Dues are as follows: Initial entry fee: $1.00; Annual General Membership: $5.00; Repeater supporters: an additional $15.00. The TARC repeater transmits on 146.91 MHz, receives -600 KHz. ARRL members are encouraged to renew (or join) their ARRL membership through the club whereupon the club will receive $1.00 per renewal. All club correspondence, including ues and donations, may be mailed to TARC at the return address below.

Dave McLean, WB4SIG, operates a private repeater on 444.150 MHz, +5MHz input..

MIRACLE CITY COMPUTER AND SOFTWARE SHOW

MIRACLE CITY MALL
TITUSVILLE
MAY 18, 19, AND 20

FOR EXHIBITOR INFO CONTACT
SUSAN RANDOLPH - (407) 255-7751

Editor's Desk

packet are included for anyone interested in this "Once in a Lifetime" experience (even though STS-37 will be another SAREX opportunity. No pictures this month... I haven't had quality results sending the file to the printer... we print no newsletter before its time! 73 and see you at the meeting... IHOP... computer show... and FIELD DAY!

Titusville Amateur Radio Club
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